THE INSTITUTION OF CIVIL ENGINEERS

BRIEFING

RoSPA

ROAD SAFETY ENGINEERING
ROAD SAFETY AUDITS

INTRODUCTION

The number of road traffic casualties continues to be unacceptably high. The municipal engineer has an important role to play in providing a 'safer' infrastructure for all road users.

Road Accident Statistics (GB 1997)[1]

Fatal Injuries	3,599
Severe Injuries	42,967
Slight Injuries	280,978
All Casualties	327,544

Average Value of Prevention per Accident[3]

Fatal	£1,042,410
Serious	£124,610
Slight	12,430
All injury	43,550
Damage only	1,210
Average cost per injury accident (including an allowance for damage only accidents)	**61,710**

Each accident generates a substantial cost in terms of resources, lost production, health-care, social benefits and in personal pain, grief and suffering. Road accidents have been estimated to cost the country over £13,000 million per year.

WHAT ARE ROAD SAFETY AUDITS ?

Road Safety Audit is a formal procedure for the independent assessment of the accident potential and predicted safety performance of a specific design. This process can be applied to new road construction schemes, highway layout alterations, maintenance schemes, traffic management schemes and the installation of any apparatus within the highway.

The main objective is to ensure that any alterations within the highway have safety as one of the key objectives; minimising the number and severity of accidents and hence injuries sustained.

A LEGAL PERSPECTIVE[5]

Section 39(3) of the 1988 Road Traffic Act states that Highway Authorities should carry out studies and take such measures to prevent accidents from occurring on both new and existing roads. RoSPA supports the 'best practice' interpretation of this to include the obligation to undertake Road Safety Audits upon all infrastructure changes.

Following the occurrence of a road accident, it may be possible that a plaintiff would argue that a Highway Authority is in breach of some or all of the above statutory duties, and/or is negligent. This would be the case if it could be shown that certain aspects of the design were contributory to the nature or level of any injury sustained in a road accident; or where it could be shown that certain procedures, such as documented Road Safety Audits, were not carried out in accordance with existing known 'best practice'.

Road Safety Audits should also be an important element in compliance with the Construction (Design & Management) Regulations 1994. This is particularly relevant for major infrastructure projects where any audit reports need to be assimilated by the planning supervisor under the *act.* With stage 1/2 audits forming just one essential element of the pre-construction Health & Safety Plan and stage 3 audits used for future infrastructure management within the Health & Safety File.

A stage 5 Road Safety Audit can also be used to identify any deficiencies in road safety on an existing highway network enabling or complementing a risk assessment process undertaken in compliance with the Management of Health & Safety at Work Regulations 1992.

THE BENEFITS OF R.S. AUDITS

The most direct benefit from undertaking Road Safety Audits is the prevention and/or reduction of casualties. The true benefit can only be determined by a detailed monitoring process at locations that have been subject to Safety Audits; which most infrastructure managers unfortunately fail to undertake.

The cost effectiveness of Road Safety Audits are at present difficult to quantify due to the 'random' nature of projects audited. The technique is still relatively new, however, over the whole-life cost of a road scheme there must inevitably be considerable cost savings.

With the average safety audit costing between £500 and £2,500, it is not difficult to see a positive cost benefit return when the average cost per personal injury accident is £61,710[3]. Experience has illustrated that savings of one accident per site per year can be achieved compared with schemes that were not audited. *(Surrey CC 1994).* On a wider scale it has been estimated that

the consistent application of safety audit procedures would give a 1% accident saving[4], and that such a saving would represent a benefit to cost ratio of about 14:1.

WHEN TO DO ROAD SAFETY AUDITS

Since 1991 Road Safety Audits have been mandatory for Trunk Road (including Motorway) improvements. However, RoSPA recommends that Road Safety Audits are undertaken on all alterations to the highway in accordance with the IHT guidelines[2] and best practice.

Road Safety Audits are typically undertaken at up to six key stages, however, some of these can be merged for simplicity on small schemes. The six stages are:

- Stage F - Feasibility / Initial Design
- Stage 1 - Preliminary Design
- Stage 2 - Detailed Design
- Stage 3 - Pre-opening
- Stage 4 - 6 / 12 months after completion
- Stage 5 - Periodic Audits (1 - 5 year intervals)

The agent responsible for management of the infrastructure, whether they be Local Authority, government executive agency, 'super-agency' or client; needs to have a clear defined procedure for the management and undertaking of Road Safety Audits. This procedure must define certain parameters to ensure both consistency and a 'fire-proof' defence against litigation. The procedure should define:

- The types of schemes to be audited
- The size of schemes to be audited
- When to audit
- The audit team expertise required
- The procedure for approving / rejecting recommendations
- Consistent documentation and the recording process

APPOINTING A COMPETENT AUDITOR !

RoSPA has been concerned for some time at the prolific increase in the number of organisations undertaking Road Safety Audits, their level of expertise, relevant experience and the consistency of reports.

A client appointing an audit team to undertake work on their behalf must ensure that the auditors have expertise appropriate to the project. In addition to a detailed inspection of an individuals curriculum vitae, the client needs to ensure that:

- The lead auditor has a background in accident investigation, reduction and prevention.
- The lead auditor understand the design & construction process.
- The audit team has a good background in highway design, traffic management and maintenance projects.
- The audit team ideally has at least two members.

Many government organisations will not accept auditors as competent unless they have attended the RoSPA AIP (two week) residential course. This is the premier training course for AIP engineers and safety auditors and has evolved since 1970 when it was managed by the former Department of Transport.

THE FUTURE

The number of Road Safety Audits undertaken will increase in the next few years in direct correlation with the competency of auditors. Hopefully the level of casualties will fall accordingly.

It is inevitable that legal precedence, case history or the level of claims, will lead to the 'tightening' of Safety Audit procedures within many Highway Authorities or infrastructure owners.

Over the next few years Road User Audits (which must not be confused with Safety Audits) will promote the development of infrastructure designed for vulnerable road users. RoSPA also predicts that stage 5 Road Safety Audits will become more widespread and to some extent replace, or complement, the current highway maintenance inspection regime.

Road Safety Impact Assessments will also be piloted in the UK. These can be used in some cases to supplement Environmental Impact Assessments when determining the likely accident generation various scheme options will have; not just within the scheme parameters but also on the surrounding road environment. The use of Road Safety Impact Assessments will form an essential element of any potential planning application to ensure no road safety dis-benefits are imposed on society.

The Royal Society for the Prevention of Accidents (RoSPA) was founded in 1917 and is now the largest safety organisation in Europe. RoSPA's accident prevention activities range far and wide.

For further details or expert advice on any aspect of Road Safety Engineering contact RoSPA's Chartered Civil Engineer Paul McCormick at RoSPA on 0121 248 2126 or Email: pmccormick@rospa.com

References

1. Road Accident Great Britain 1997 (RAGB). DETR.
2. Guidelines for The Safety Audit of Highways, IHT, 1996.
3. Highways Economic Note 1. 1997. (Oct. 1998) (HEN 1) DETR.
4. Road Safety Audit & Safety Impact Assessment, ETSC, 1997.
5. RoSPA - Road Safety Engineering (AIP). Training courses evolved since 1971.

Further Reading

- DETR Traffic Advisory Leaflets - Various free on 0171 676 2478.
- Road Safety Audit, Austroads, 1994.
- A safety auditors view of New Roundabout Design, Warws. CC, 1995.
- DETR Design Manual for Roads & Bridges - Volume 5, Section 2, Part 2, HD 19/94, Road Safety Audits. And read in conjunction with the Advice Note - Volume 5, Section 2, Part 3, HA 42/94, Road Safety Audits.
- Guidelines on Urban Safety Management - IHT, 1990.
- RoSPA Road Safety Engineering Manual, Second Edition, 1995.
- What goes wrong in highway design ...and how to put it right, Common criticisms and advice from safety auditors, AA Group Public Policy, Norfolk House, Basingstoke. Available from 28 January 1999
- Road Safety Audits, ITE, 1995
- FHWA Study Tour for Road Safety Audits

Briefing Sheets are provided free of charge to help increase knowledge and awareness. They may be freely copied. Care is taken to ensure information is correct, however readers are advised to consult source documents for authoritative information. The Institution of Civil Engineers is a registered charity No 210252, 1 Great George Street, London SW1P 3AA.